

WHAT IS CLAIMED IS:

1. A pneumatic rubber tire having a circumferential rubber tread configured with spaced apart raised lugs designed to be shock absorbingly ground  
5 contacting, a supporting carcass underlying said tread, a pair of spaced apart beads, and rubber sidewalls extending radially outward from said beads to the peripheral edges of said tread, wherein said raised lugs have an average height of their surface intended to be ground contacting from the base of the lugs on the tire tread in a range of about 12.5 cm to about 80 cm;  
10 wherein said tread is a closed cellular structured rubber composition comprised of, based on parts by weight per 100 parts by weight rubber (phr):
  - (A) at least one diene-based elastomer, or
  - (B) an isobutylene copolymer based elastomer, or
  - (C) an elastomer composition comprised of  
15 (1) about 75 to about 90, phr of at least one isobutylene copolymer based rubber, and  
(2) about 10 to about 25, phr of at least one diene-based elastomer selected from polymers of isoprene and/or 1,3-butadiene and copolymers of styrene with isoprene and/or 1,3-butadiene;  
20 wherein said isobutylene copolymer elastomer is selected from:
    - (A) butyl rubber as a copolymer of isobutylene and isoprene containing from about 0.5 to about 6 weight percent units derived from isoprene,
    - (B) halobutyl rubber as a halogenated butyl rubber where the halogen is selected from bromine or chlorine, preferably bromine, or  
25 (C) brominated copolymer of isobutylene and paramethylstyrene.
2. The tire of claim 1 wherein the ratio of running surface of the tread lugs to the tread's gross dimensions is in a range of from about 15 to about 22 percent.
- 30 3. The tire of claim 1 wherein the volumetric closed cell content of the tire tread, which includes the spaced apart tread lugs is in a range of from about 2 to about 15 percent based upon a volume percent of cellular voids in the total volume of the tread rubber.

4. The tire of claim 1 wherein the average size of the closed cells in the tread rubber is a range of from about 150 to about 350 microns.

5. The tire of claim 1 wherein said blowing agent is selected from the group consisting of dinitrosopentamethylene tetramine, N, N'-dimethyl-N, N'-dinitrosophthalamide, azodicarbonamide, sulfonyl hydrazides such as benzenesulfonyl hydrazide, tolunesulfonyl hydrazide and p,p'-oxybis-(benzenesulfonyl semicarbazide).

10 6. The tire of claim 1 wherein said blowing agent is a composite of benzenesulfonyl hydrazide and paraffinic oil in a weight ratio in a range of from about 60/40 to about 75/25.

15 7. The tire of claim 1 wherein a thin layer of a rubber composition as a vulcanizable blend of diene-based rubber and one or more of said isobutylene-based rubbers, in a weight ratio of from 30/70 to 70/30 of such diene-based to said isobutylene-based rubbers, is positioned between said tread and said carcass.

20 8. The tire of claim 1 wherein said rubber composition is comprised of is at least one diene-based elastomer.

9. The tire of claim 1 wherein said rubber composition is comprised of a copolymer of isobutylene and isoprene.

25 10. The tire of claim 1 wherein said rubber composition is comprised of a diene-elastomer and a copolymer of isobutylene and isoprene.

11. The tire of claim 1 wherein said isobutylene-based rubber is a brominated copolymer of isobutylene and paramethylstyrene.

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12. The tire of claim 4 wherein the volumetric closed cell content of said tire tread is in a range of from about 2 to about 15 percent based upon a volume percent of cellular voids in the total volume of the tread rubber.